

CLAIMS

We claim:

1. A process for drying substrates coated with liquid waterborne basecoats, comprising the steps of: (a) applying a waterborne basecoating composition to a surface of the substrate; (b) exposing the basecoating composition to air having a temperature ranging from about 20° C to about 40° C for a period of about 30 seconds to volatilize at least a portion of volatile material from the liquid basecoating composition, the velocity of the air at a surface of the basecoating composition being about 0.3 to about 1 meter per second; (c) applying heated air to the basecoating composition for a period of about 30 seconds to 2 minutes, the velocity of the air at the surface of the basecoating composition being about 1.5 to about 15 meters per second, the air having a temperature ranging from about 30° C to about 90° C; (d) applying infrared radiation and heated air simultaneously to the basecoating composition for a period from about 30 seconds to 2 minutes, the velocity of the air at the surface of the basecoating composition being about 1.5 to 5 meters per second, the air having temperature of from about 30° C to about 60° C, such that a sufficiently dried basecoat is formed upon the surface of the substrate; and (e) applying a topcoating composition over the basecoat.
2. The process according to claim 1, wherein the substrate is metal selected from the group consisting of iron, steel, aluminum, zinc, magnesium, alloys and combinations thereof.
3. The process according to claim 2, wherein the metal substrate is an automotive body component.
4. The process according to claim 1, wherein the period ranges from about 30 seconds to about 2 minutes in step (b).
5. The process according to claim 1, wherein the infrared radiation applied in step (d) is emitted at a wavelength in the near- to intermediate-infrared region ranging from about 0.7 to about 20 micrometers.
6. The process according to claim 5, wherein the infrared radiation applied in step (d) is emitted at a wavelength in the near-infrared region ranging from about 0.7 to about 4 micrometers.
7. The process according to claim 1, wherein the period ranges from about 30 seconds to about 45 seconds in step (c).

8. The process according to claim 7, wherein the period ranges from about 30 seconds to about 45 seconds in step (d).

9. The process according to claim 1, wherein the topcoat is applied over the basecoat wet on wet.

5 10. The process according to claim 1, further comprising an additional step of simultaneously curing the basecoating composition and the topcoating composition after application of the topcoating composition.

10 11. The process according to claim 1, wherein the substrate is a polymeric substrate and wherein the peak temperature of the substrate during the process does not exceed the heat distortion temperature of the polymeric material.

12. The process according to claim 1 wherein the radiation source is microwave energy.